

FOOD EXPO
PRE-SHOW REPORT

FOOD ENGINEERING

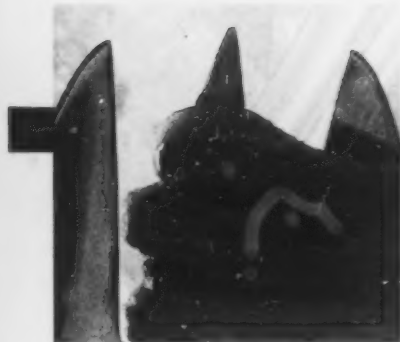
CHILLED FOODS



DEVELOPMENT
MANUFACTURE
DISTRIBUTION

***** 5-DIGIT 20814
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SUSAN GARNER
CONGRESSIONAL INF SVC
4520 EAST-WEST
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FOOD ENGINEERING



ABOUT THE COVER

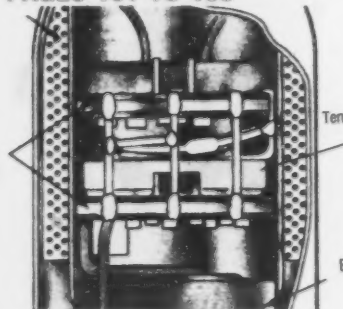
Fresh foods are becoming "signature items" for an increasing number of supermarkets, but the problems associated with national distribution still need to be addressed.

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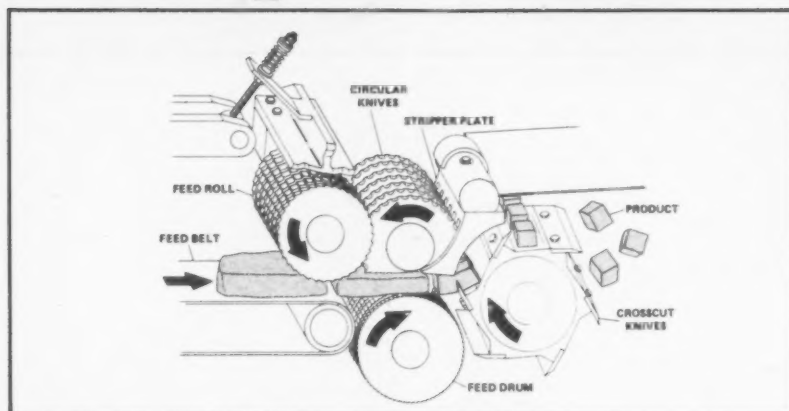
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Food industry should shoulder some blame...

Mixed signals sent by the food industry, along with the media, government, and public interest groups, are partly responsible for the public's fear of pesticides and preservatives said Jack Cox, (pictured at right), president of the Foundation for American Communications (FAC). It is a Los Angeles-based educational foundation (sponsored by more than 125 media and other business corporations) that trains food companies in public relations, and journalists in writing proficiently about economics, environmental science, law and ethics. As an example of food companies sending mixed signals, Cox mentioned the dog food commercial that advertises that it does not contain pesticides or preservatives.



Speaking before Public Voice's 14th Annual National Food Policy Conference, Cox said news organizations mistakenly assigned political reporters to cover California's Big Green initiative, which was essentially an environmental story.

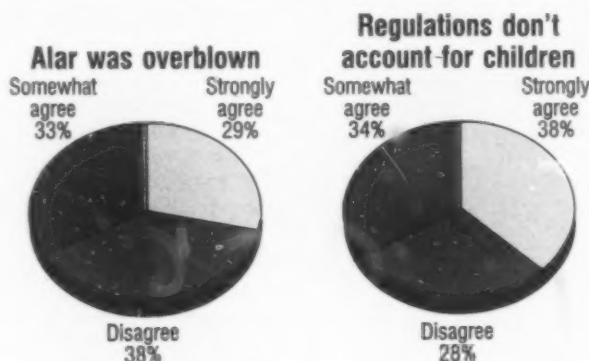
He also addressed public mistrust by saying, "It is ironic that while the nations of Eastern Europe and even the Soviet Union are turning radically toward democracy, **too many Americans are losing faith in our system.**" Cox also offered pointers for businesses to reclaim public trust: address the public's feelings; involve the public in decision making; answer phone calls from the press; admit past mistakes and lack of knowledge; avoid jargon; let technical people sensitive to the public answer questions; and develop a constructive relationship with journalists. For further information, contact FAC at (213) 851-7372.

...while organic controversy rages

Public Voice for Food and Health Policy, which sponsored the conference in cooperation with the National Food Processors Association (NFPA), said that cosmetic quality standards for fresh produce are too high and encourage overuse of pesticides. Almost 53 percent of the retailers* polled by Public Voice said consumers would be more likely to buy blemished produce if they were told it was grown using less pesticide.

After retail and wholesale organics sales posted four years of growth, last year the segment experienced a downturn, according to Public Voice. The special interest group faults separate marketing of organic produce and said higher prices for organic produce result from supermarkets failing to locate local growers or shippers who offer the highest degree of volume, variety and quality, according to Public Voice.

While Public Voice says there is interest in pesticide-free food, a study completed by the Center for Produce Quality (a foundation created by the Produce Marketing Association and the United Fresh Fruit and Vegetable Association) said 85 percent of the public agrees that washing fresh produce is an effective way to ensure it is safe to eat. Whatever their level of concern about safety, almost a third report their families are **eating more fresh fruits and vegetables** over the past year, with only seven percent reporting they are eating less.



Source: Center for Produce Quality.

While more than half of the consumers surveyed agree the alar threat was overblown, a greater number think more studies should examine how pesticides on food may effect children.

Turn on the lites!

Low calorie	37.1 %
Low fat	41.4
Saturated fat	35.3
Reduced cholesterol	38.4

▲ More than one-third of FE's Executive Advisory Panel said their companies are developing healthier foods.

Just a few years ago, marketing executives in the U.S. said, "Healthy doesn't sell." Nothing could be further from the truth today. New-generation healthier foods are derived from new-generation technologies in lowering fat and cholesterol. Such was the subject of the second annual conference on "Fat and Reduced Cholesterol Foods," sponsored by Food Engineering and International Business Communications. Held March 14-16 in Atlanta, the conference drew nearly 400 attendees. This month's *Engineered Foods* will provide a look at the topics presented. First, an overview of three challenges.

Mimetics + substitutes = replacers

As consumers clamor for healthy foods, technologists will need to know the strengths and limitations of various fat replacers before incorporating them into new food products. Fat replacers fall into one of two distinct categories, mimetics and substitutes, each with its own particularities.

Fat mimetics are compounds that help replace the mouthfeel of fats but cannot substitute for fat on a pound-for-pound basis. They generally contain a great deal of water so they cannot be used for frying. Mimetics can be further broken down by source: for example, *Simplese*® (NutraSweet Co.) is a protein-based mimetic; *Oatrim*™ (Rhône-Poulenc) and *Avicel*® (FMC) are cellulose-based; *N-Oil* (National Starch) and *Sta-Slim* (A.E. Staley) are starch-based mimetics.

Fat substitutes are molecules whose physical and thermal properties resemble fat. Theoretically, they can replace fat in all applications, even frying. But many promising new substitutes are still awaiting FDA approval. Procter and Gamble's *Olestra*® (sucrose polyester) was patented in 1971, but is still not commercially available. Other companies are also playing the waiting game: Frito-Lay (malonate ester), CPC International (trialkoxycarballate)

and Curtice-Burns (alkyl glycoside polyester) are among them.

Sensory Implications

Sylvia Jones of Leatherhead Food Research Associates (U.K.) suggests taking a "holistic approach" to the development of a reduced fat food. Lowering the fat content of a food requires adding new ingredients to retain acceptable textural characteristics.

"Reduced-fat products, especially spreads, are characterized by distinct off-flavor notes that are less clearly perceived in full-fat products," commented Jones. "Proper rounding of flavor notes and creating a mouthcoating effect is necessary." Equally important is the partitioning of flavor components between fat and oil phases in the food. This helps to modulate flavor release during chewing, forming the actual perception of flavor.

Labeling

Sooner or later, anyone involved with low-fat formulations will

Expanding efforts by food processors to develop foods lower in fat and cholesterol attempt to reverse an alarming trend: one person dies every minute from heart disease in the US.

have to confront the issue of product labeling. Virginia Wilkening, a nutritionist with the FDA, commented that the Nutritional Labeling and Education Act of 1990 is undergoing revisions concerning nutritional label content, nutritional label format, ingredient labeling, description/food standards and health claims.

Marketers will need to toe the line under the new rulings—"no cholesterol" claims will soon be illegal in products that never contained chole-

sterol, such as peanut butter. However, the product *can* be branded in such a way as to educate the consumer. In other words, although you can't call your product "no cholesterol peanut butter," you may call it "peanut butter: a no-cholesterol food."

Next year's conference is slated for March 25 and 26 in Philadelphia. Contact International Business Communications, 8D Pleasant Street, South Natick, MA 01760, or phone (508) 650-4700 for more information. ▲

Is it live or is it SPE?

Like the Memorex ads, scientists are asserting that sucrose polyesters (SPE) synthesized from soybean oil are virtually identical to conventional salad oils with respect to physical properties. Thus, new substitutes like *Olestra* are expected to perform well in reduced-fat products. **Composition:** Both soybean SPE and salad oils are liquid at room

temperature. Carbohydrate polyesters must contain at least 50 percent unsaturated fatty acids to be liquid at ambient temperatures. Soybean SPE is 53 percent unsaturated. GLC determinations indicate that salad oils are also at least 50 percent unsaturated.

Color: Based on refractive indices, SPE is nearly indistinguishable from corn or safflower oil. To the naked eye, both soybean SPE and safflower oil are a pale yellow color.

MARKETPLACE

Sales opportunities burgeon for fat replacers

Fat reduction technology has infiltrated many product categories. Today, 10 percent of retail sales in applicable categories are devoted to reduced-fat products. Clearly, growth opportunities abound for the fat replacers used in these foods.

"Potential dollar sales volume for any particular fat substitute can be estimated by evaluating recent per capita fat and oil consumption in the U.S.," said Dr. Marvin J. Rudolph, director of technology and product development at A.D.

	Margarine	Salad/ Cooking Oils
Consumption, lb. per capita	8.7	23.5
Estimate of market potential	33%	25%
Probable replacement level	50%	33%
Lb. fat substitute per capita	1.44	1.94
Lb. fat substitute for population	360 million	485 million
Fat substitute sales at \$1.50/lb.	\$540 million	\$730 million

A.D. Little's research shows market potential for fat replacers based on per capita fat consumption by product category. (Source: A.D. Little.)

Little, Inc. (Cambridge, MA). "The per capita fat consumption multiplied by two factors—an

estimate of the reduced-fat market potential and the most probable level of fat replacer—yields an estimate for per capita consumption."

For example, assuming *Brand X* fat substitute sells for \$1.50 a pound (roughly five times the price of soybean oil), the potential market value

can be calculated. A potential market worth \$540 million exists for margarine products alone. Proctor & Gamble's *Olestra*® is expected to be a big player in this category, pending its approval.

The low-fat salad dressing and mayonnaise market continues to grow each year. Figures indicate that fat replacer sales for this category could reach \$730 million—leaving the door wide open for NutraSweet's *Simplexse*® and Kraft's *Trailblazer*™.

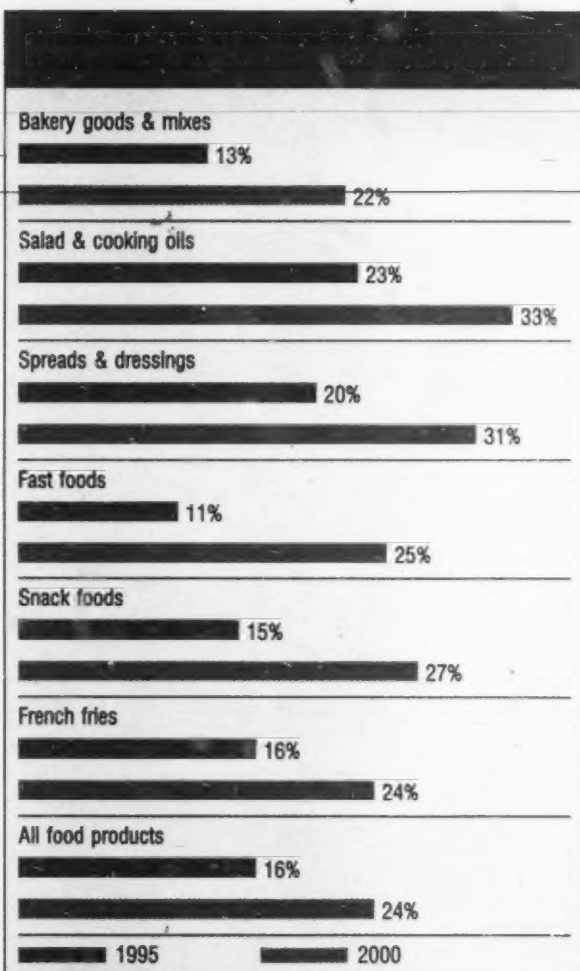
Apparently, there's something in it for everyone in the fat replacer field, but the ones who walk away with the biggest prizes are those who best imitate fat's sensory appeal.

The future of canola looks bright

Canola oil, one of the healthiest vegetable oils available today, rose from relative obscurity,

thanks to the upsurge of low-saturated-fat formulations. James M. Stanton, a consultant with Experience, Inc. (Minneapolis, MN) proposed the future market for canola.

Stanton estimates that by the year 2000, more



▲ These results were obtained from a Delphi study and are accurate to plus or minus 3 percent. (Source: Experience, Inc.)

than 30 percent of salad oils and dressings will contain canola. Overall, he expects nearly 25 percent of all food products will use canola as their fat source.

Flavor problems and future solutions

Much attention has been given to the creation of mouthfeel systems in reduced-fat foods. Much less has been given to correcting the flavor problems associated with lower fat content. "There are tricks you can use in masking the effects of removing fat," stated Dr. Simpey Kuramoto, vice-president and business director of Givaudan Corporation. "You can always add more vinegar to salad dressing or more cinnamon to a coffee cake." But providing true fatty notes to a product is a different story.

Currently, the market interest in fatty flavors is in advance of supply and manufacture. But Kuramoto said that flavor companies are on the "cusp of change." Following are some new approaches under development:

- Fatty flavors will soon be used to mimic butterfat in yogurts and frozen desserts, and improve tactile sensations in baked goods.
- Melted cheese flavors would find application in macaroni and cheese entrees and process cheese.
- Mayonnaise and salad dressings would benefit

from eggy notes (when egg yolks are removed) and vinegar toners.

● A full line of fried flavors developed for hamburgers, chicken and potatoes can enhance the characteristic notes of these products.

● Fried corn and masa corn notes improve the flavor of reduced-calorie snacks that are baked, not fried.

Givaudan Corp., 100 Delawanna Ave., Box 5034, Clifton, NJ 07015 **Circle 207**

Customizing starch blends

Reduced fat formulations can be "custom-designed" with A.E. Staley's *STA-SLIM*, its line of modified potato and tapioca starches, used in conjunction with an instant granular starch or gum. "Since no one single ingredient can replace the character of fat in a product, we take a total ingredient approach," said Michael Augustine, group leader of food starch technical services at Staley.

A tapioca starch combination works best in baked goods, lending creaminess. Potato starches are more suited to meats and salad dressings, as their greater setback produces almost complete thickening.

A.E. Staley Mfg. Co., 2200 E. Eldorado St., Decatur, IL 62525

Circle 212

INGREDIENT
BUYERS
SURVEY

'HEALTHY'

means business

Interest in healthy foods impacts both ingredient buying decisions and R&D.

LETICIA MOORE
TECHNICAL EDITOR

For three years running, in our Ingredient Buyers Survey, the number one influence on ingredient buyers and product developers has been the formulation of healthy foods. But it's not as though nothing new is happening in food research. Rather, progress occurs in increments, not breakthroughs. Evolution, not revolution, is the name of the game.

Reducing fat and calories will continue to be a major influence according to *Food Engineering's* 1991 Executive Advisory Panel, and the bywords are "more" and "better." The panel sees room for improvement in current healthy food formulations—as consumer demand increases, so will research efforts. A director of marketing at an Alabama dairy believes that "fat will be engineered so as to become a non-factor." Many panelists feel that non-fat foods will achieve the same sensory qualities as full-fat foods. "Eventually," said one Illinois product manager, "healthier foods will meet consumer demands."

Reduced levels of sodium, cholesterol and saturated fat are often partnered with reduced-calorie foods.

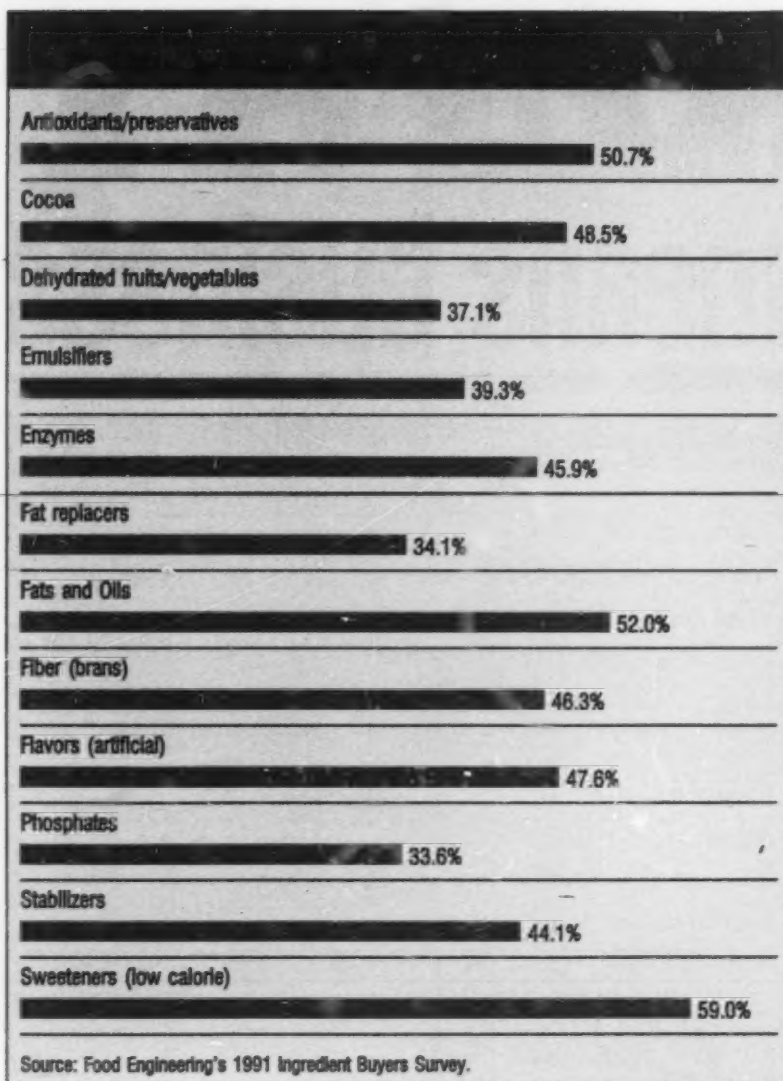
	No factor	Minor factor	Major factor
Natural ingredients			✓
Lessen/eliminate preservatives		✓	
Vitamin fortification	✓		
Low/reduced calorie			✓
Low/reduced fat			✓
Saturated fat		✓	
Reduced cholesterol		✓	
Adding fiber	✓		
Non-irradiated ingredients	✓		
Pesticide-free ingredients	✓		
HAACP at supplier		✓	
SPC at supplier		✓	
Microwave-specific foods	✓		
Proposition 65		✓	

Source: Food Engineering's 1991 Ingredient Buyers Survey.

It follows that these were also important influences on the food industry. Respectively, 67, 73 and 67 percent of the panel rated these issues as such. On the other hand, fiber seems to have lost its luster—55 percent of respondents said it would not be an influencing factor.

Use of natural ingredients is also of prime importance, especially in the beverage industry, where 61 percent

INGREDIENT BUYERS SURVEY



felt this was a major factor in their buying decisions. The bottled water craze owes its popularity to the many true-to-nature fruit flavors available.

Hand in hand with using more natural ingredients is the trend toward lessening or eliminating preservatives. Forty-six percent of all respondents cited this as a factor. This may also be helped by packaging. Advances in packaging systems "will reduce, perhaps eliminate the dependence on preservatives," said one project engineer.

Other trends are surfacing, say our

panelists. HACCP (hazard analysis/critical control points) and SPC (statistical process control) programs are receiving more consideration within food companies, and the companies involved in these programs expect the same of their ingredient suppliers. Proposition 65 is a piece of legislation that concerns many decision-makers: 34 percent saw it as an influence, and another 37 percent saw it as a major influence. Currently, the use of non-irradiated ingredients and pesticide-free ingredients are not an influence on buying decisions, but with the recent upsurge of organic food introductions, next year's tally may reflect a different attitude.

Better sweeteners needed

The impact of healthy foods resurfaced when we asked our panel which ingredient classifications fell short of desired performance. Respondents from each area of the food industry, including 72 percent of bakers, called for improved low-calorie sweeteners. There are limited options currently available for low-calorie heat-stable sweeteners. A technical director in Minnesota noted that the approval of new sugar replacers like sucralose would be a boon to the industry.

Ingredient buyers also want to see improvement in fats and oils technology. "Research should continue to probe into lipid chemistry, developing 'healthy fats,'" said the research head of a major cereal manufacturer. His response was echoed by panelists from the meat, bakery, dairy and frozen foods industries. "Fats and oils will be genetically engineered to avoid hydrogenation," said one food scientist from Illinois. Another scientist agreed: "Coconut oil will be engineered to act like soybean oil, and vice versa."

Advances in biotechnology will also benefit enzyme manufacturers, another area where the panel felt demand exceeded available technology. "But with enzymes—we as an industry are close," volunteered a research director from Wisconsin.

Finally, the panel saw a real need

for developing natural preservatives and antioxidants to extend shelf life. Fifty-one percent of all respondents and 79 percent of those in the canned and shelf-stable segment said they were not satisfied with their options. It seems that many processors view the use of natural preservatives as part of the healthy food trend. However, some feel that the answer lies in the past, not the future. A return to the old methods of preservation was one idea supplied by a Chicago packaging executive. Another Chicago executive, exasperated with what he called "gimmick" sales promotions, was ready for a "dose of the back-to-basic foods of yesteryear."

R&D today

Nearly 50 percent of FE's respondents said that R&D was a high or top priority at their company. Increased visibility of research departments comes from a demand for more truly new products. And in many cases, "truly new" can be read as "new and healthy," as a wave of developers fuel the healthy food fervor.

Less dramatic, but also important, is the newly-forged relationship between research and manufacturing—59 percent of panelists thought opening the lines of communication was a positive change. The team concept (see sidebar) has evolved from this

	Less development	Improve existing products	Staff reductions	Less capital investment
Meat	17.3%	34.7%	16.0%	30.7%
Bakery	15.4	29.2	16.9	29.2
Dairy	17.1	26.3	13.2	26.3
Flavors/ Ingredients	18.1	22.2	11.1	20.8
Fruit/ Vegetables	17.9	39.3	17.9	42.9
Fats, Oils	15.2	32.6	19.6	26.1
Frozen	18.9	18.9	18.9	27.0
Confections	16.3	26.5	20.4	26.5
Cereals	18.2	29.1	20.0	27.3
Beverages	12.2	30.6	16.3	26.5

Source: Food Engineering's 1991 Ingredient Buyers Survey.

practice.

R&D personnel are also working more extensively with ingredient suppliers. Increasing cooperation between ingredient suppliers and food companies can benefit both sides of the equation: companies are satisfied

Is the 'team concept' for real?

There's a lot of talk about the "team concept" of product development—members of engineering, marketing, production and research departments working together to create and promote new products. Sounds good on paper, but do food companies really subscribe to this theory?

Apparently, the answer is yes: According to our survey, 75 percent of respondents said the team concept

is used at their company. Some of the more avid proponents explained:

• "We save time in development by checking production capabilities, labeling and sales needs at one time and working all ends together for a smooth flow to introduction of product." — *Manufacturing supervisor, PA*

• "It's the only way to get buy-in from all parties." — *Engineer, WI*

• "[It's] much more cost efficient in the long run, preventing problems once product goes to manufacturing." — *Director of research, CA*

But not everyone is sold on the team concept. Many panelists who said they *didn't* use the team concept speculated that the power structure at their companies would discourage this type of arrangement—decisions were made at the top,

they said. The mention of egos also cropped up regularly. And at some companies, rivalries exist between departments or individuals that hinder the notion of teamwork. Perhaps these companies could explore the dynamics of their organization to create a more functional and creative working climate. As one Texas executive summed up, "more heads are better than one."

INGREDIENT BUYERS SURVEY

POSITIVE

Demand for more truly new products	62.5%
New healthy formulations	59.8%
Interface between R&D and Manufacturing	59.0%
Increasing cooperation between suppliers and food companies	50.7%
Need to keep high quality/low cost in balance	49.3%
Demand for more line extensions	35.4%
New formulations for changing processing requirements/techniques	35.4%
Wider selection of ingredients	30.6%
Customer's ingredient safety concerns	26.6%

NO EFFECT

Food company mergers	46.3%
Ingredient company mergers	41.5%
QC responsibility on R&D	38.4%
Computerization/Automation	31.0%

NEGATIVE

Increased work loads	32.3%
Tighter budgets	31.9%

Source: Food Engineering's Ingredient Buyers Survey 1991.

with good service and the ingredient supplier creates a solid reputation.

Traditional concerns such as line extensions, the high quality/low cost balance and processing refinements are still considered important to the product developer. The wider selection of ingredients makes the food scientist's job easier; and consumer concern over the ingredients used in their food ensures that the search for new, safe ingredients will continue.

In terms of what does and does not affect research operations, we saw three perspectives from the panel. First, mergers no longer affect research, said almost half of the panel. Perhaps this is because many companies are already operating "lean and mean," so that personnel from an acquired company are often absorbed into the new structure. The merging of ingredient companies also has no effect on R&D. However, this may result in better service and a wider selection of ingredients.

Even adding QC responsibilities and computerization to R&D seems to have no overall effect on its function. This philosophy is in keeping

with many companies' synergistic views. Job descriptions are much less structured, so that if a new practice allows the company to operate more efficiently, it is adopted whether it fits into the classic bureaucratic structure or not.

Recessionary times are bound to have a negative effect on R&D. Technologists work harder on existing products while coping with staff reductions and less capital investment. Right? Not according to the panel—47 percent said the recession would have no effect on their operation. However, 32 percent of the remaining respondents were feeling the affects of increased work loads and tighter budgets. Fourteen percent of the panel expected to reduce their staff size, but less than two percent feared their facility would be closed.

We analyzed the results across all product categories, and discovered that panelists from every sector indicated they would be doing about 15-20 percent less development work. However, flavor and ingredient manufacturers, when compared to the others, are doing more work on new products. Those in the meat and canned foods industries will be spending their time and money improving existing products. Not surprisingly, panelists working in fats and oils or confections feared staff reductions the most. After all, these products were targeted as "no-no's" in a healthy diet. Finally, 43 percent of panelists from the canned foods sector cited less capital investment as an effect of the recession.

Recession or not, many factors influence ingredient buying decisions and the direction of research. But, regardless of the size of a company's pocketbook, one thing is clear. Creating a successful new product is impossible without creative formulations made from innovative ingredients.

The Food Engineering Ingredient Buyers Survey is available at a cost of \$125. To purchase it, call Anne Hartnett at (215) 964-4444 or fax (215) 964-4273. ▲